

Yucca Mountain :Comments by

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 43 years of experience in teaching and research in radiation measurement (and applied health physics), in
 radiobiology, environmental radioactivity and radioactivity transport, & dose assessment.

Member: American Physical Society study group on nuclear fuel cycles and waste management (see peer reviewed report)

Rev. Mod Phys. Vol 50, No 1., part II, Jan 1978

I do not speak for that study group, as it was disbanded upon completion of its task.

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SEP 05 2001

My Position: I support the Doe process to place a long term spent reactor fuel repository at the Nevada Test Site.

I believe the decision should be made on the basis of science and engineering, not politics
 Employment status: Recently retired.

Reasons: The orderly management of our nuclear power reactors spent fuel is long overdue, the benefits will be positive for us, our children, our grandchildren, the state of Nevada, the U.S., and the world.
 Economic benefits to the state long term

Include addition of some financial stability to the Beatty area, which has suffered severely from the economic dislocation caused by shutdown of the gold mining activities there.

4. Place nuclear electric power generation on a surer foundation assuring greater electric supply for the US.
5. Help the US to deal in a more orderly manner with the problem of dwindling fossil fuel reserves and other resources

6. Restore this citizens faith in the ability of the federal government to manage waste for the long term, an activity the government said is too important to be taken on by any other organization.

7. Restore the credibility of the U.S. govt. abroad in nuclear energy and energy development

8. If the US senate had not overwhelmingly rejected the Kyoto treaty on limiting Co2 emissions to the atmosphere, its implementation would require shutting down all coal burning electricity generating plants in the U.S. If global warming continues we may yet face a curtailment in fossil generated electricity. Then it will be advantageous to have the nuclear electric generating option to mitigate widespread economic disemployment and distress.

Some important concepts:

1. No radiation can leave the repository, only radioactive atoms.
2. The only credible way for significant amounts of radioactivity to eventually leave the repository site is by hydrogeologic transport.

And the rate of transport of the radionuclides will be much slower than the convective rate of water flow except for heavy hydrogen-3 called tritium which will move at the rate of normal water. The amount of Tritium will be limited due to the small yield in nuclear fission, and radioactive decay during transport with a half life of 12 years (tenth life 40 years)

The hydrologic transport of all other radionuclides will be significantly impeded by such phenomena as ion exchange on particle or mineral surfaces
 Ranges of different radiations.

~~The hydrologic transport of all other radionuclides will be significantly impeded by such phenomena as ion exchange on particle or mineral surfaces~~

Alpha—sheet of paper, dead layer of human skin

beta about 6 feet in air, less than an inch in rock or soil

gamma mean free path in air, about a football field length, in rock less than several feet.

Useful conversion factor:

$$2.3 \times (\text{half life}) = (\text{tenth life})$$

half life is the time required for half of a pure radioactive isotope to decay. In a tenth life 90% decays. The longest lived fission products are Sr-90 and Cs-137 with half lives of about 30 years and tenth lives of a century. Thus in 2 centuries only 1% of the Sr-90 will remain as radioactive and in 6 centuries one one millionth. In spent reactor fuel, the long term hazard is dominated not by fission products but by radionuclides also found naturally such as Ra-226

Rather than obdurate opposition, the people of Nevada would be in a good position to ask the Federal Govt. for something in return if the repository is sited here. Your talented and well placed senators and congressmen could certainly craft legislation to return ownership of most of the State from the Federal Govt. back to the State and its people

Although my opinion is not probably shared by most people here, let us agree to disagree and agree not to be disagreeable.

McDonald E. Wrenn
 09/05/01.